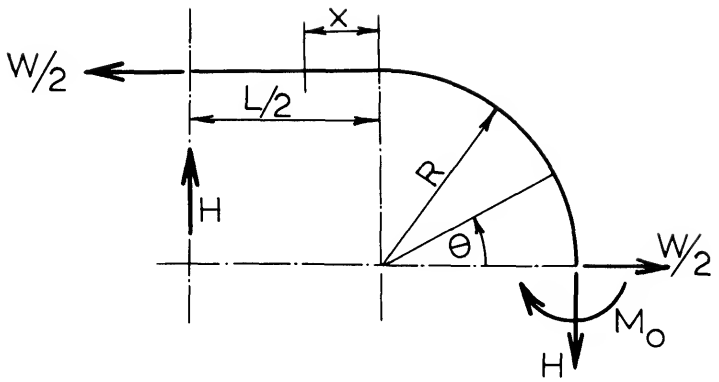

Fig. 29.4 Equilibrium model of a quarter of a studded link.

stated in a similar manner

$$\int_0^{\pi/2} M_1 \frac{\partial M_1}{\partial H} R\, d\theta + \int_0^{L/2} M_2 \frac{\partial M_2}{\partial H}\, dx = 0 \tag{29.11c}$$

Here, again, using Eqs. (29.11a) and (29.11b), we get

$$\frac{\partial M_1}{\partial M_0} = \frac{\partial M_2}{\partial M_0} = 1 \tag{29.11d}$$

$$\frac{\partial M_1}{\partial H} = R(1 - \cos\theta) \tag{29.11e}$$

and

$$\frac{\partial M_2}{\partial H} = R + x \tag{29.11f}$$

Hence, introducing Eqs. (29.11a), (29.11b), and (29.11d) to (29.11f) into Eqs. (29.9a) and (29.11c), integrating, and solving the two simultaneous equations, yields

$$M_0 = \frac{WRC_1}{2} \tag{29.12}$$

and

$$H = \frac{WC_2}{2} \tag{29.13}$$

where

$$C_1 = \frac{(k+2)[k^3 + 6k^2 + 12k(4-\pi) + 48(\pi - 3)]}{k^4 + 4\pi k^3 + 48k^2 + 24\pi k + 24(\pi^2 - 8)} \tag{29.14}$$